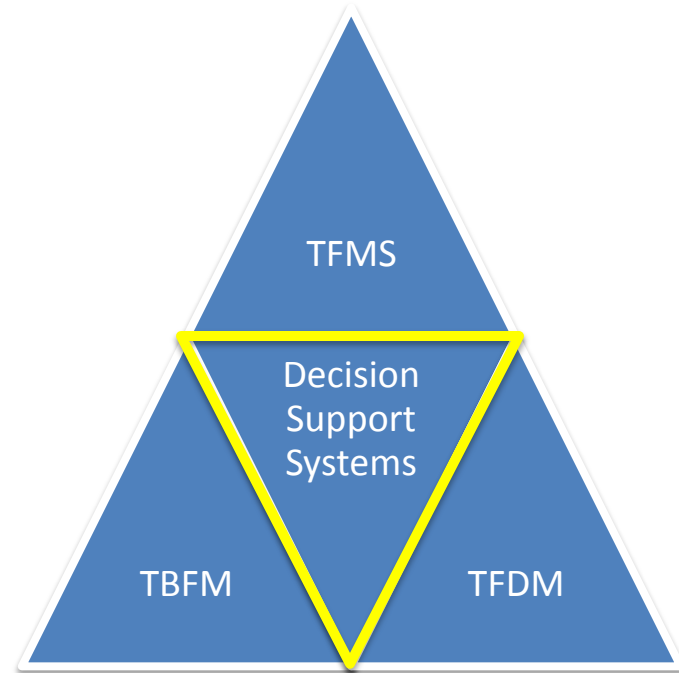# CDM
Collaborative Decision Making

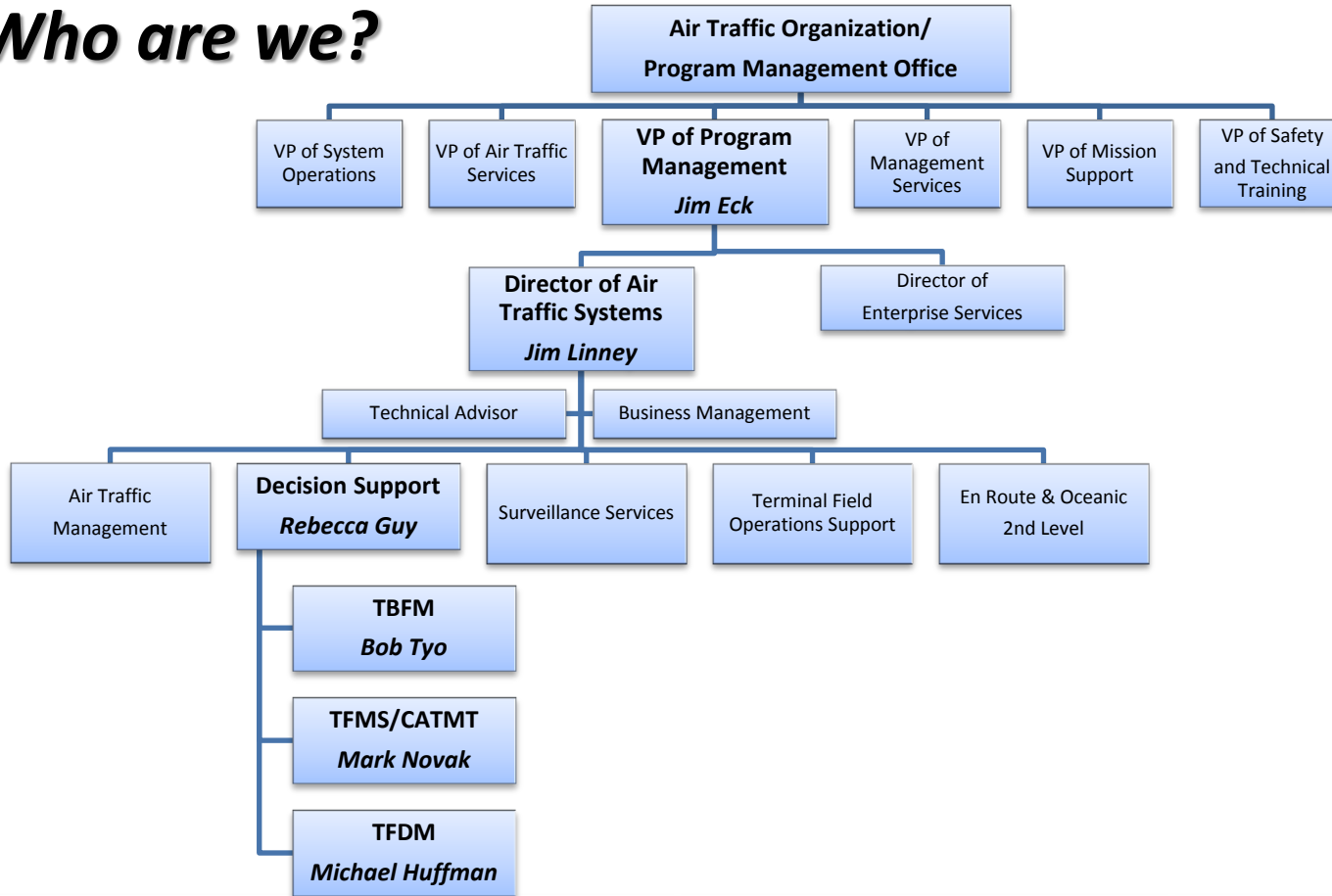Decision Support
Systems Status

Topics

- ➢ DSS Vision – Rebecca Guy
- ➢ TFDM – Mike Huffman
  - • *Recent Activities*
- ➢ TBFM Status – Bob Tyo
  - ➢ *Recent Activities*
- ➢ TFMS Status – Mark Novak
  - • *Release schedule*
  - • *Data availability*
  - • *Connectivity*
- ➢ *Q&A*

DSS: Who are we?

Air Traffic Organization/ Program Management Office

- VP of System Operations
- VP of Air Traffic Services
- **VP of Program Management** — *Jim Eck*
- VP of Management Services
- VP of Mission Support
- VP of Safety and Technical Training

Under VP of Program Management (Jim Eck):
- **Director of Air Traffic Systems** — *Jim Linney*
- Director of Enterprise Services

Under Director of Air Traffic Systems (Jim Linney):
- Technical Advisor
- Business Management

- Air Traffic Management
- **Decision Support** — *Rebecca Guy*
- Surveillance Services
- Terminal Field Operations Support
- En Route & Oceanic 2nd Level

Under Decision Support (Rebecca Guy):
- **TBFM** — *Bob Tyo*
- **TFMS/CATMT** — *Mark Novak*
- **TFDM** — *Michael Huffman*

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Decision Making

DSS Mission: Traffic Flow Management (TFM)

- ➢ **NextGen is an ongoing transformation of the NAS**.
  - Incremental implementation of new technologies and procedures is vital to meeting future growth of aviation.

- ➢ **DSS facilitates NextGen vision through TFM – TFDM, TBFM and TFMS**
  - Ensures efficient flow of traffic and maximizes system throughput across the NAS
  - Improves the quality of service to NAS users by accommodating user preferences
  - Improves common situational awareness by real-time information sharing

TRAFFIC FLOW MANAGEMENT

AOC ATCSCC		CTOP/TOS			Jan – Aug 2012 Jan – Aug 2013
IDAC		RRIA	TMA		
Strategic Functions	Taxi, Take-off & Climb			Descent, Final Approach & Taxi	Cross-Domain Analysis
PREFLIGHT	**DEPARTURE**	**CRUISE**	**FLOW MANAGEMENT**	**ARRIVAL**	**POST FLIGHT**
Surface		*En Route*			*Surface*

DSS Vision: Enabling NextGen

➢ **Enable NextGen technologies in TFM operations**

   ✓ Performance Based Navigation (PBN) –use of RNAV/RNP and Optimized Profile Descent (OPD) technologies in TBFM

   ✓ System Wide Information Management (SWIM) – TFM data exchange with external systems through SWIM

   ✓ System-wide solutions that are able to be tailored for individual aircraft –

     ✓ Surface

     ✓ Routes- Utilizing user preferences

➢ **Provide integrated, responsive and collaborative TFM solutions that maximize efficiency and reduce delay.**

   ✓ *INTEGRATED:* Strategic and tactical TFM strategies are modeled and implemented as a single cohesive strategy.

   ✓ *RESPONSIVE:* Faster more effective responses to evolving conditions in the NAS.

   ✓ *COLLABORATIVE:* Data sharing among stakeholders facilitates solutions that impose no more controls on flights than needed, allowing flight operators to fly their preferred routes at preferred times.

Integrated TFM: 3Ts Working Together
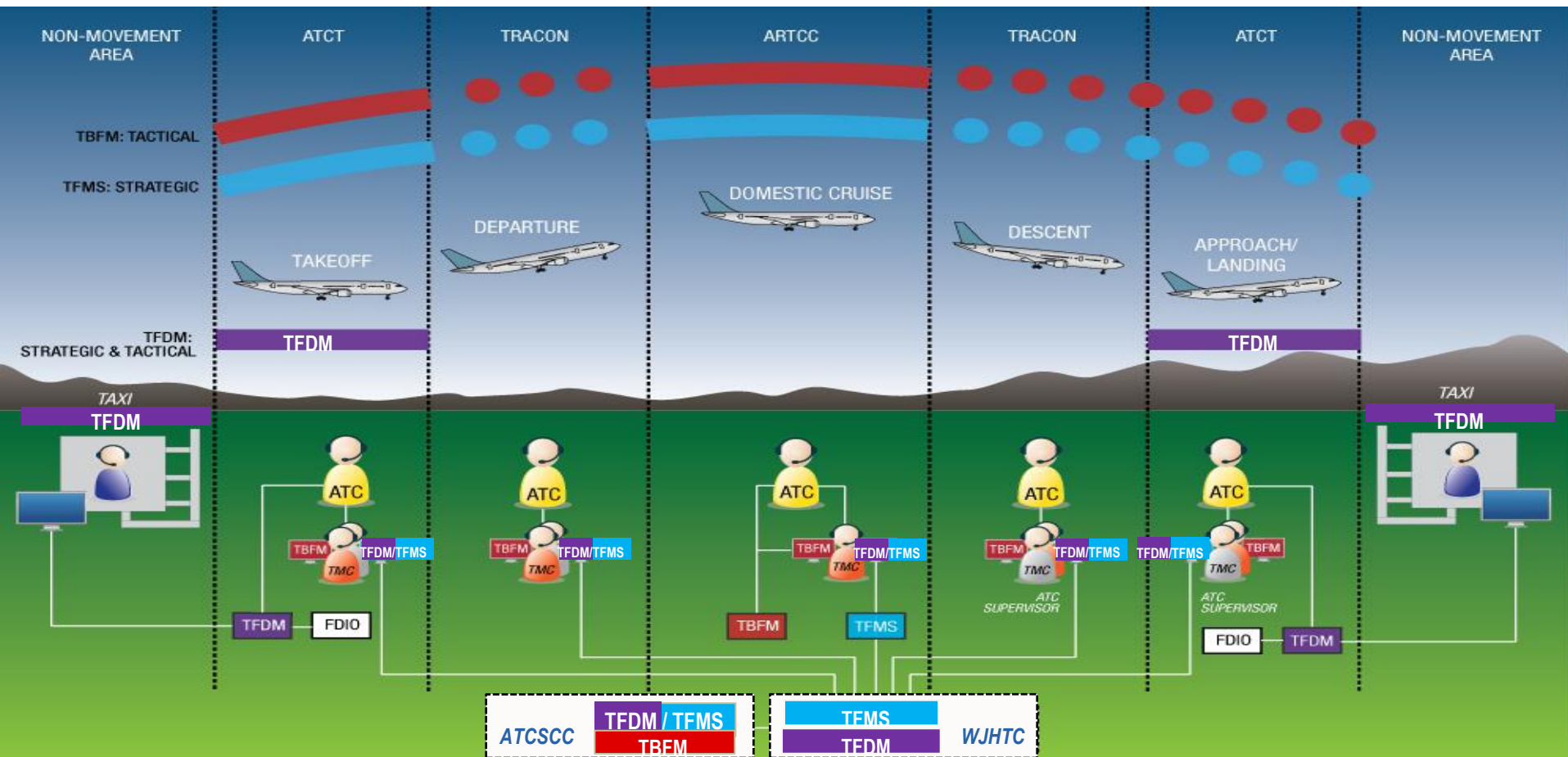
DSS Accomplishments: TFDM

➢ Since March 2014 :

- ✓ Achieved Initial Investment Decision (IID) – March 2014

- ✓ Conducted an Operational Evaluation Review (OER) at PHX – March 2014

- ✓ Released Request for Information (RFI) #3 – April 2014

- ✓ Finalized and received Joint Resources Council (JRC) approval on Early Implementation Strategy – May 2014

- ✓ Completed Rescope of the entire program and received JRC approval – August 2014

- ✓ Conducted Industry Outreach event – October 2014

- ✓ Conducted an Operational Evaluation Review at LAS – October 2014

- ✓ Released Draft Screening Information Request (SIR) and conducted vendor 1-on-1s – November 2014-through January 2015

- ✓ Conducted an Operational Evaluation Review (OER) at SFO – March 2015

- ✓ Completed Initial Operating Capability (IOC) at all 9 Surface Visualization Tool (SVT) sites (ATCSCC, SCT, NCT, PCT, SDF, C90, I90, A90, N90)

DSS Accomplishments: TBFM

➢ Since March 2014:

✓ WP2 - Completed Information Sharing Software – March 2014 (3/13/14)

✓ WP2 - Implemented Information Sharing (internal) – April 2014 (4/24/14)

✓ WP2 - Completed Extended Metering via keysite of June 2014 (6/24/14)

✓ Supported Ground Based Interval Management for Spacing (GIM-S) Acquisition Program Baseline(APB) milestone; Initial Operating Capability(IOC) of 9/22/14

✓ WP2 - Completed Integrated Departure Arrival Capability (IDAC), Convective Weather (Conv Wx) and Area Navigation (RNAV) SW Development in July 2014 (7/16/14)

✓ WP2 - Implemented Information Sharing (external) – July 2014 (7/24/14)

✓ WP2 - Completed IDAC Discovery Site Testing – September 2014 (9/25/14)

✓ WP2 – IDAC, Conv Wx and RNAV functionality in November 2014 (APB)

✓ WP3 – Final Investment Decision (FID) on track for April 2015

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DSS Accomplishments: TFMS

➢ Since March 2014:

    ✓ Collaborative Trajectory Options Program (CTOP) – March 2014

    ✓ Final Investment Decision (FID) Remote Site Tech Refresh – June 2014

    ✓ Initial Investment Decision (IID) Collaborative Air Traffic Management Technologies (CATMT) Work Package 4 (WP4) – June 2014

    ✓ Route Availability Planning Tool (RAPT) in Chicago, NY, PHL, PCT – August 2014

    ✓ Released Draft Screening Information Request (SIR) - October 2014

        • Vendor comments will be posted NLT April 30 2015

    ✓ Traffic Flow Management (TFM) Data feed – November 2014

    ✓ Special Use Airspace (SUA) data in TFMS – November 2014

    ✓ Completed Release 11 OT&E – March 2015

    ✓ Continued to host TFMS monthly technical webinars

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Terminal Flight Data Manager (TFDM) Program
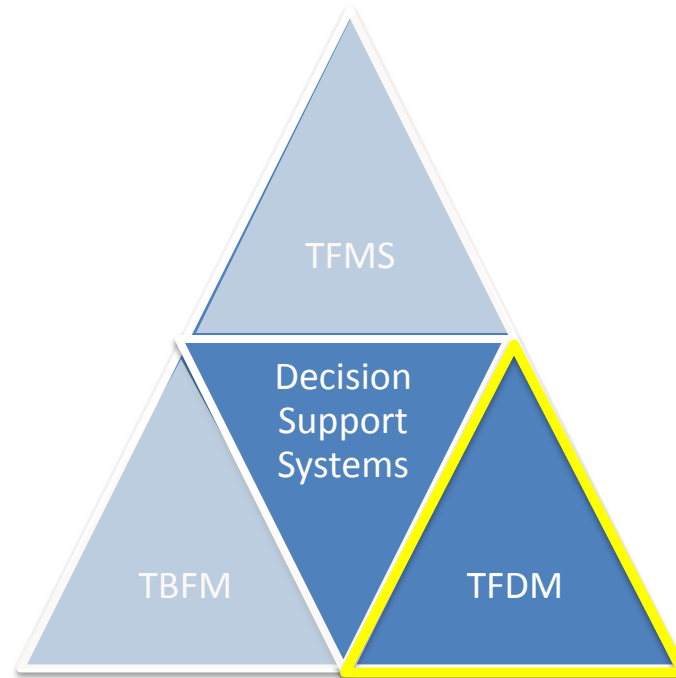
Agenda

- TFDM Background & Schedule

- TFDM Program Overview

- TFDM Benefits

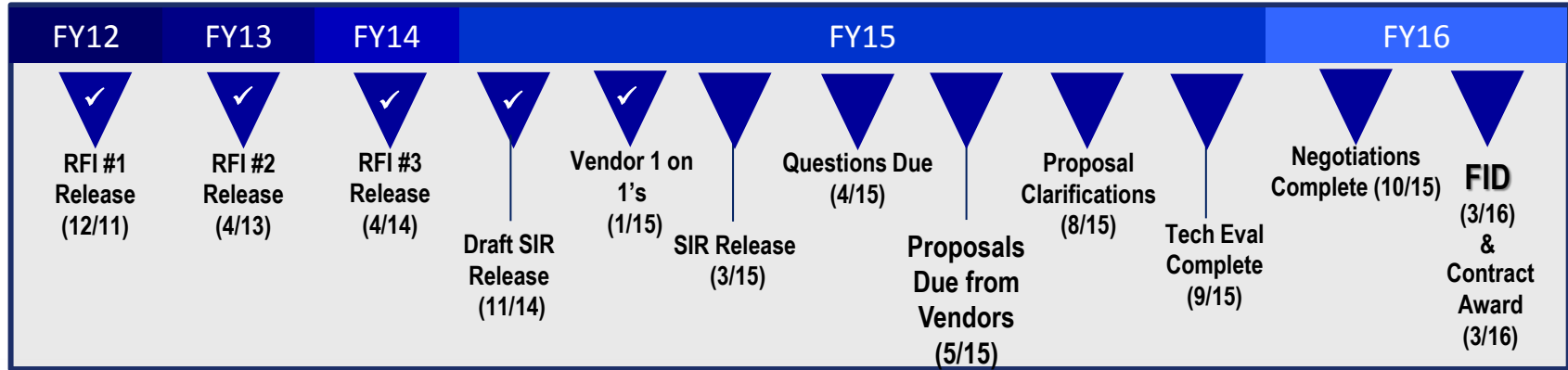- Sites by Configuration
- Acronyms

Program Status
AMS Lifecycle Status & Upcoming Milestones

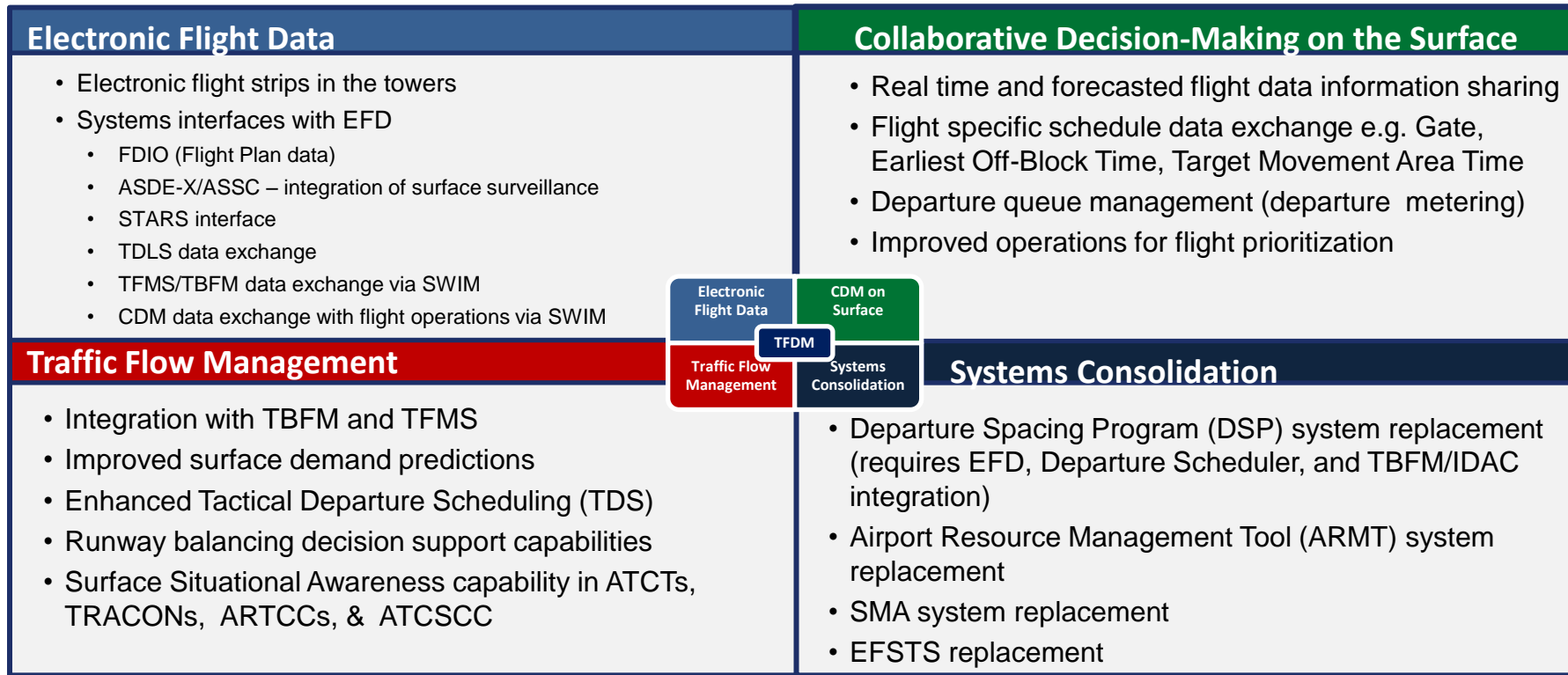*Recent Joint Resources Council (JRC) decisions include:*

- **March 2014:** Provided an Initial Investment Decision (IID)

- **May 2014:** Approved the TFDM Early Implementation Strategy

- **August 2014:** Approved a full program rescope

- **March 2016:** Planned Final Investment Decision (FID)

Key TFDM acquisition activities are as follows:

FY12	FY13	FY14	FY15	FY16
RFI #1 Release (12/11)	RFI #2 Release (4/13)	RFI #3 Release (4/14)	Draft SIR Release (11/14) · Vendor 1 on 1's (1/15) · SIR Release (3/15) · Questions Due (4/15) · Proposals Due from Vendors (5/15) · Proposal Clarifications (8/15) · Tech Eval Complete (9/15)	Negotiations Complete (10/15) · FID (3/16) & Contract Award (3/16)

Please note TFDM information in this briefing may be subject to change until the FAA's Final Investment Decision is complete.

TFDM Program Overview

Electronic Flight Data

- Electronic flight strips in the towers
- Systems interfaces with EFD
  - FDIO (Flight Plan data)
  - ASDE-X/ASSC – integration of surface surveillance
  - STARS interface
  - TDLS data exchange
  - TFMS/TBFM data exchange via SWIM
  - CDM data exchange with flight operations via SWIM

Collaborative Decision-Making on the Surface

- Real time and forecasted flight data information sharing
- Flight specific schedule data exchange e.g. Gate, Earliest Off-Block Time, Target Movement Area Time
- Departure queue management (departure metering)
- Improved operations for flight prioritization

Electronic Flight Data	CDM on Surface
TFDM	
Traffic Flow Management	Systems Consolidation

Traffic Flow Management

- Integration with TBFM and TFMS
- Improved surface demand predictions
- Enhanced Tactical Departure Scheduling (TDS)
- Runway balancing decision support capabilities
- Surface Situational Awareness capability in ATCTs, TRACONs, ARTCCs, & ATCSCC

Systems Consolidation

- Departure Spacing Program (DSP) system replacement (requires EFD, Departure Scheduler, and TBFM/IDAC integration)
- Airport Resource Management Tool (ARMT) system replacement
- SMA system replacement
- EFSTS replacement

Please note TFDM information in this briefing may be subject to change until the FAA's Final Investment Decision is complete.

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TFDM Monetized Benefits Identified at IID

Airport Operators (27 Configuration A Airports)

Estimated Lifecycle benefits at Configuration A Airports (Risk-Adjusted FY14 $M):
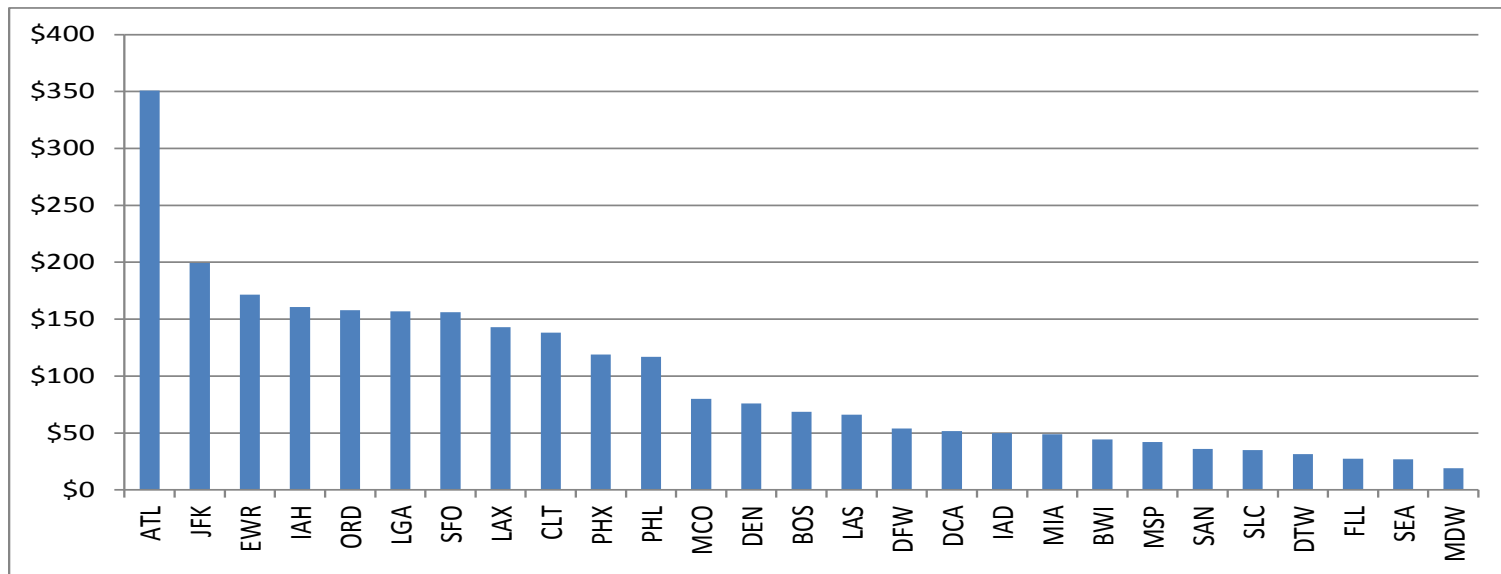
Please note TFDM information in this briefing may be subject to change until the FAA's Final Investment Decision is complete.

TFDM Benefits

Flight Operators

- Improved Predictability
- Less Taxi Time / Out Fuel Burn
- Improved Crew Utilization
- Increased Reliability of Connections

Electronic Flight Data (EFD) in the ATCT enables real time data sharing. This is vital to maximize the efficiency of Collaborative Decision-Making on the Surface.

Airport Operators

- Reduced CO_2 Footprint
- Improved Predictability
- Reduced Engine Noise

- En Route
- Descent
- Airport Turnaround
- Climb
- En Route

Air Traffic Control

- Better Information for Tactical Rerouting
- Fewer Aircraft in the Movement Area and Departure Queue (through departure metering)
- Better Sector Demand Loading Predictions
- Improved Surface Situational Awareness
- Improved Predictability
- Fewer Restrictions

Passengers

- Improved Predictability
- Fewer Delays
- More Reliable Schedule Completion
- More Time Using Terminal Amenities
- Improved Passenger Satisfaction

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TFDM Monetized Benefit Outcome Definitions
(Identified at IID)

Flight Operators (Airlines), Airport Operators, ATC, & the Flying Public (Passengers)

1. **Departure queue management** - Providing tools to improve pushback planning thereby shifting taxi delay from the taxi phase to the gate or non-movement area leading to reduced fuel burn and operating costs (63% of total monetized benefits)

2. **Increased opportunity for flight prioritization** - Improving coordination and data sharing between the ATC system and flight operators to give airlines more flexibility in prioritizing flights based on business needs (10% of total monetized benefits)

3. **Increased opportunity to take CFR delay at gate** - Improving coordination and data sharing between the ATC system and flight operators to shift CFR delay from the taxi phase to the gate (1% of total monetized benefits)

4. **Improved off-time compliance related to controlled departure times** - Providing more accurate predictions of event and taxi times to allow better compliance with the current controlled departure times (EDCT, CFR) (15% of total monetized benefits)

5. Improved reroute and shared fix coordination - Providing surface SA displays in TRACON and ARTCC to better coordinate reroutes and shared resource planning , reduces costs to maintain any current Surface SA displays (0.6% of total monetized benefits)

FAA & Taxpayers

1. **System consolidation** - Consolidating legacy ATCT systems to reduce supportability costs (10% of total monetized benefits)

2. **Elimination of paper flight strips** - Removing paper strips and supporting infrastructure (printers etc.) to reduce costs (0.3% of total monetized benefits)

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Planned Sites by Configuration

Configuration A (Full Capability, including CDM, TFM, and EFD/S) – 27 Sites

- BOS – Logan Int'l Airport
- DEN – Denver Int'l Airport
- DFW – Dallas/Fort Worth Int'l Airport
- EWR – Newark Liberty Int'l Airport
- IAH – George Bush Int'l Airport
- JFK – John F. Kennedy Int'l Airport
- LGA – LaGuardia Airport
- SEA – Seattle-Tacoma Int'l Airport
- ATL – Hartsfield-Jackson Atlanta Int'l Airport
- BWI – Baltimore/Washington Int'l Thurgood Marshall Airport
- CLT – Charlotte Douglas Int'l Airport
- DCA – Ronald Regan Washington Int'l Airport
- DTW – Detroit Metropolitan Wayne County Airport

- FLL – Fort Lauderdale/Hollywood Int'l Airport
- IAD – Washington Dulles Int'l Airport
- LAX – Los Angeles Int'l Airport
- MCO – Orlando Int'l Airport
- MDW – Midway Int'l Airport
- MIA – Miami Int'l Airport
- MSP – Minneapolis-Saint Paul/Int'l Airport
- ORD – O'Hare Int'l Airport
- PHL – Philadelphia Int'l Airport
- PHX – Phoenix Sky Harbor Int'l Airport
- LAS – McCarron Int'l Airport
- SAN – San Diego Int'l Airport
- SLC – Salt Lake City Int'l Airport
- SFO – San Francisco Int'l Airport

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Planned Sites by Configuration

Configuration B (Primarily Electronic Flight Data/Strips) – 62 Sites

- CLE – Cleveland Hopkins Int'l Airport
- IWA – Phoenix-Mesa Gateway Airport
- DVT – Phoenix Deer Valley Airport
- RDU – Raleigh –Durham Int'l Airport
- PVD – Theodore Francis Green State Airport
- IND – Indianapolis Int'l Airport
- BDL – Bradley Int'l Airport
- DAY – Dayton Int'l Airport
- SDL – Scottsdale Airport
- BUF – Buffalo Niagara Int'l Airport
- SMF – Sacramento Int'l Airport
- PIT – Pittsburgh Int'l Airport
- SJC – San Jose Int'l Airport
- OMH – Port Columbus Int'l Airport
- TPA – Tampa Int'l Airport
- STL – Lambert-Saint Louis Int'l Airport
- CVG – Cincinnati/Northern Kentucky Int'l Airport
- OAK – Oakland Int'l Airport
- HPN – Westchester County Airport
- FXE – Fort Lauderdale Executive Airport
- JAX – Jacksonville Int'l Airport

- BNA – Nashville Int'l Airport
- TEB – Teterboro Airport
- SDF – Louisville Int'l Airport
- LIT – Little Rock National Airport
- CHS – Charleston Int'l Airport
- ISP – Long Island MacArthur Airport
- MEM – Memphis Int'l Airport
- BHM – Birmingham Shuttlesworth Int'l Airport
- PBI Palm Beach Int'l Airport
- OMA – Eppley Field
- MGM – Montgomery Regional Airport
- GSO – Piedmont Triad Int'l Airport
- LNK – Lincoln Airport
- GPT – Gulfport – Biloxi Int'l Airport
- ORF – Norfolk Int'l Airport
- SAV – Savannah/Hilton Head Int'l Airport
- TYS – McGhee Tyson Airport
- DAB – Daytona Beach Int'l Airport
- ICT – Wichita Mid-Continent Airport
- CAE – Columbia Metropolitan Airport
- RIC – Richmond Int'l Airport
- ADW – Andrew Air Force Base

- BOI – Boise Airport
- HSV – Huntsville Int'l Airport
- MAF – Midland Int'l Airport
- ANC – Ted Stevens Anchorage Int'l Airport
- LEX – Blue Grass Airport
- BIL – Billings Logan Int'l Airport
- FSM – Fort Smith Regional Airport
- TLH – Tallahassee Int'l Airport
- AVP – Wilkes-Barre/Scranton Int'l Airport
- CRP – Corpus Christi Int'l Airport
- FWA – Fort Wayne Int'l Airport
- AZO – Kalamazoo/Battle Creek Int'l Airport
- PRC – Ernest A. Love Field, Prescott. AZ
- SYR – Syracuse Hancock Int'l Airport
- HNL – Honolulu Int'l Airport
- PDX – Portland Int'l Airport
- HOU – William P. Hobby Airport
- DAL – Dallas Love Field
- SAT – San Antonio Int'l Airport

CDM Collaborative Decision Making

Please note TFDM information in this briefing may be subject to change until the FAA's Final Investment Decision is complete 18

TFDM Early Implementation
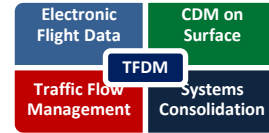
Prior to the implementation of TFDM capabilities, the Program Office is managing the implementation of the following:

CDM on Surface
TFMS Enabled Data Exchange for additional data elements

TFM
Deployment of Surface Visualization Tool at 9 sites (ATCSCC, SCT, NCT, PCT, SDF, C90, I90, A90, N90); the current capability will be subsumed by TFDM/TFMS **(Complete)**

EFD
Sustainment of the PHX AEFS prototype and deployment of additional AEFS prototypes at approximately 4 sites (CLE, LAS, SFO, CLT)

Systems Consolidation
Limited Tech Refresh of the EFSTS system

Note: Early Implementation will mitigate schedule and technical risks to TFDM deployment by enabling testing, data collection, and assessments to enhance the TFDM System capabilities through early discovery and realization of early benefits.

Terminal Flight Data Manager (TFDM) Program

Time Based Flow Management (TBFM)
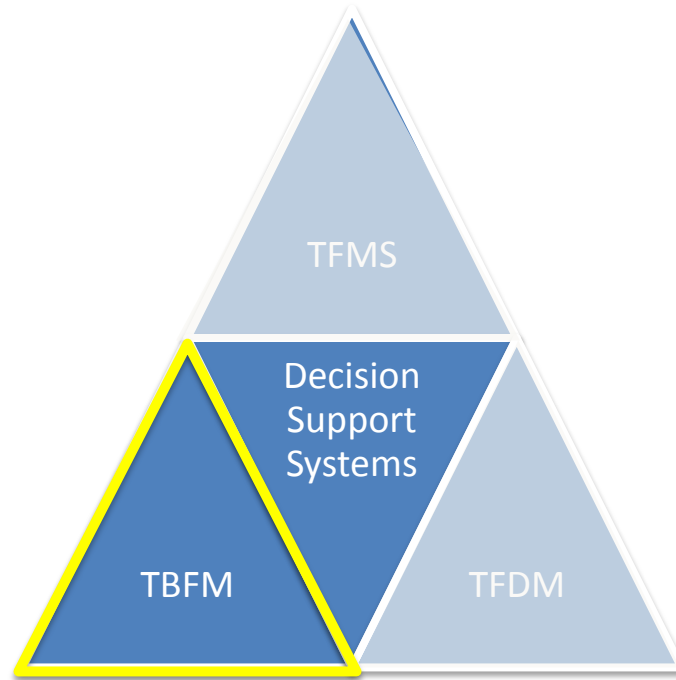
Vision Statement

The vision for TBFM is the expanded use of time based metering to enable gate-to-gate improvements in both fuel and throughput efficiencies by: applying spacing only where needed, allowing for the routine use of Performance Based Operations (PBO) to capitalize on advanced aircraft Flight Management System (FMS) capabilities, and adding more predictability to the ATC system.

TBFM Release Summary

	2014	2015	2016	2017
	J F M A M J J A S O N D	J F M A M J J A S O N D	J F M A M J J A S O N D	J F M A M J J

Info Sharing (ZTL - Delta)

Extended Metering/GIM-S (IOC at ZAB/PHX)

GIM-S Implementation and Site Adaptation (5 FY15 targets)

IDAC, RNAV (IOC at ZLA/LAX/BUR)

IDAC Implementation (ZID, ZDC, ZOB, and ZBW)

WP3 FID

IDAC Implementation – TBD dates (ZAB, ZJX, ZME, ZOA, and ZTL)

Terminal Spacing and Sequencing Design and Development (IOC at ZAB/PHX in 2018)

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Information Sharing

- Provides additional information on metering operations to NAS users
  - SWIM-compliant approach providing metering information to NAS systems (TFMS) and external users

- Benefits (Non-NAS Consumers/Airlines)
  - Better predict arrival/departure times of aircraft
    - Insight into scheduled wheels-up times (scheduled departure time) once TBFM schedules a departure
    - Enhance situational awareness to improve airport/gate utilization
- Benefits (NAS Consumers)
    - Improve coordination between multiple FAA Systems to maximize efficiency
    - Conduct analysis of TBFM TMIs

- Key Milestones
  - April 2014 - ZTL started publishing data to SWIM; Volpe consuming.
  - July 2014 – MOA signed between FAA and Delta; Delta consuming.
  - Mar 2015 – Planned Enhancement; Filter Data for increased usability.

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Information Sharing

- Supports RTCA Task Force 5 Operational Capability 46 and 47 (Improved CATM and Integrated System Wide Approach)
  - TBFM publishing the following categories of information:
    - Aircraft Information
      - Includes flight plan information, MRE information, ETAs, STAs, etc.
    - Configuration Information
      - Arrival Airport Configuration, Acceptance Rates, etc.
    - Metering Status Information
      - TMA Metering Status Group, Interface Status Group, etc.

What is GIM-S?

- Ground-Based Interval Management – Spacing (GIM-S) comprises a set of ground functions to support operations to:

  - Increase opportunities for <u>Optimized Profile Descents</u> (OPDs) by pre-conditioning the spacing and sequencing of the arrival stream
  - Minimize the use of vectoring for problem resolutions
  - Improve trajectory modeler performance with ADS-B data
  - Provide speed advisories to assist in the delivery of aircraft to a Meter Point/Meter Fix

- Functionality allocated across multiple platforms, creating this NextGen capability

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Architecture

Speed Clearances

Speed Clearances
Acceptance/Rejection

Scheduling and
Sequencing

Trajectory
Modeling

Problem
Prediction and
Resolution

Meter Lists and Constraints

Speed Advisories

ADS-B Surveillance

Speed Advisory Acceptance

Speed Advisories

ATC Response

Display
Processing

ERAM

HADDS/EDDS

TBFM
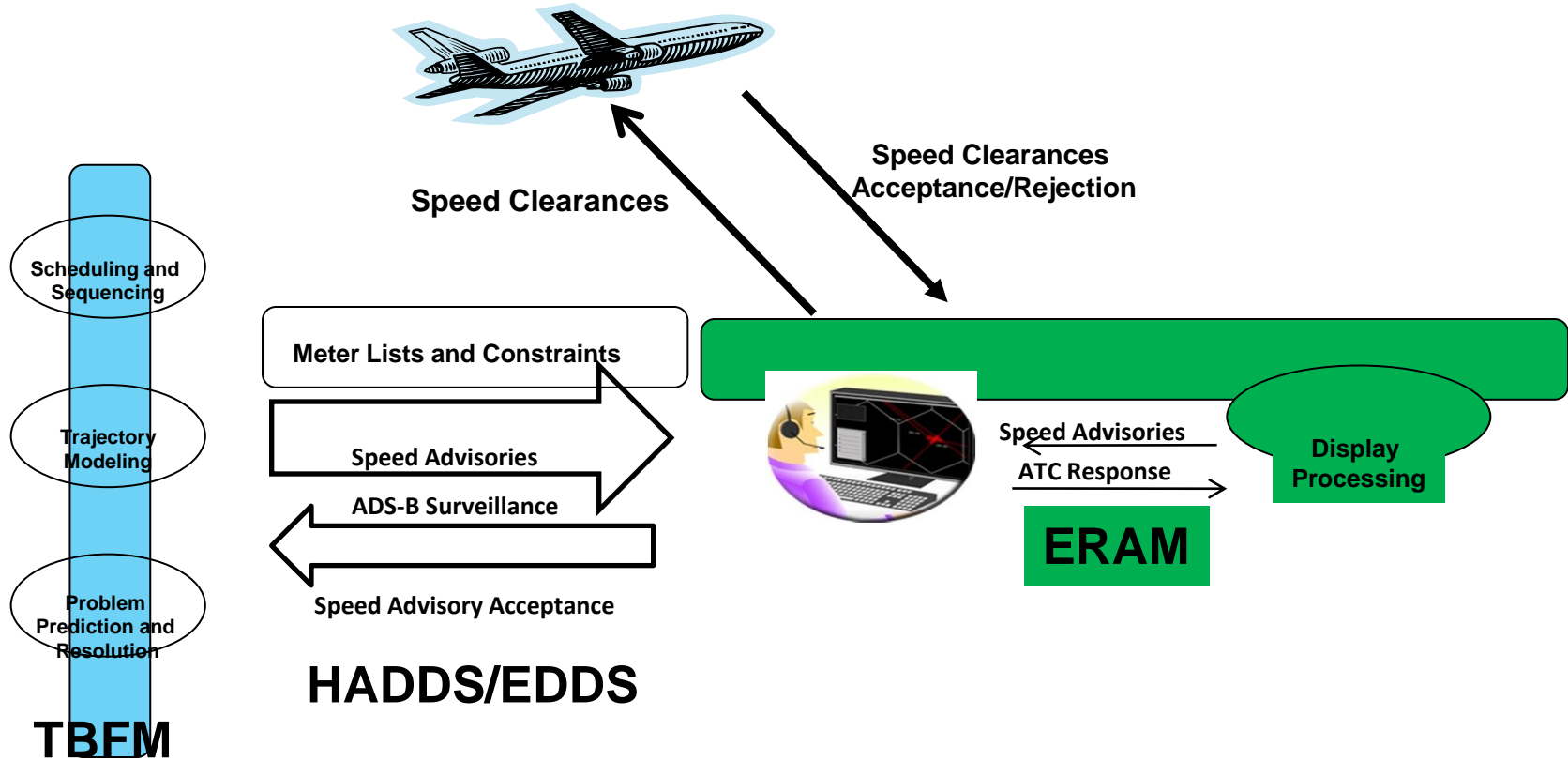
Release 4.2; Extended Metering and Speed Advisory in support of GIM-S.

- GIM-S IOC concluded 9.2.14; GIM-S in use at ZAB.

- ZAB discontinues use of metering during high wind events
  - Three-phase fix (June-Nov phasing)
    - Reducing age of wind data from 2➔1 hr,
    - correcting wind direction (parralax data),
    - standardizing interpolation methodolgy)

ZAB; "Benefits of GIM-S during normal conditions greater than issues during wind events."

Release 4.2; Extended Metering and Speed Advisory in support of GIM-S.

FY15 Activity Targets; 3Q-4Q

- Phoenix International Airport (PHX)
  - ZDV → ZAB (PHX) (New ACM Arrangement)
- Los Angeles International Airport (LAX)
  - ZOA → ZLA (LAX) (Coupled Scheduling)
- Denver International Airport (DEN)
  - Speed Advisory within current metering
  - Incorporate XM within ZDV airspace
  - Expand ACM to ZLC
- Minneapolis – St. Paul International Airport (MSP)
- George Bush Intercontinental/Houston Airport (IAH)

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Release 4.3; IDAC (100,000 ft view)

- Automates the process of monitoring departure demand and identifying departure slots.

- Coordinates the departure times between airports and provides situational awareness to Air Traffic Control Towers (ATCT) so that they can select from available departure times
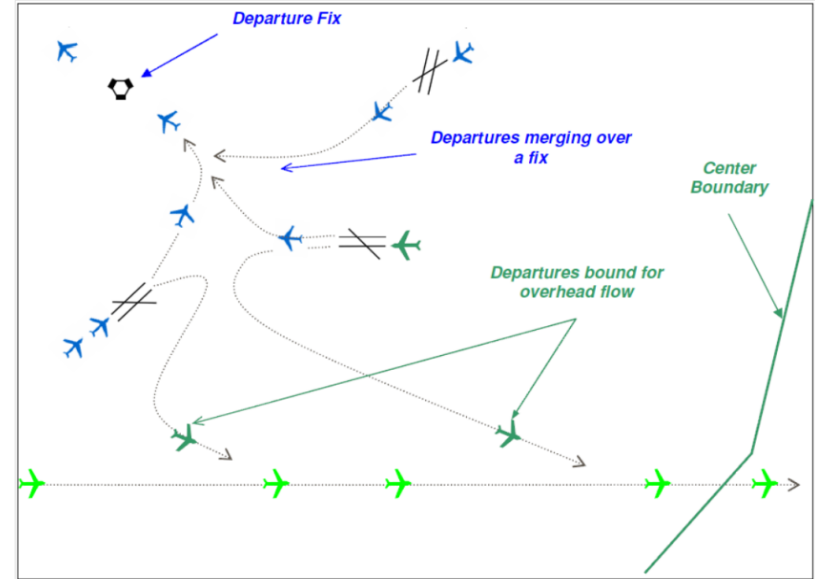
The results of these enhancements are more efficient departure flows and less delay.

Release 4.3; IDAC (50,000 ft view)

- IDAC deploying HW to 15 new towers as well as existing towers

ZLA		ZOB		ZBW	
	LAX		DTW		BOS
	LAS		CLE		BDL
	SAN		PIT		PVD
	SNA		BUF		ALB
	BUR		ROC		MHT

ZID		ZDC	
	CVG		IAD
	IND		DCA
	SDF		BWI
	CMH		RDU
	DAY		RIC

New Facility

- Provides a new User Interface for ATCTs/ARTCC for departure management called the Integrated Departure Scheduler (IDS)

Release 4.3; IDAC and RNAV/RNP

- Last release for Work Package 2 APB Milestone.
- Successfully keysited at ZLA, LAX, BUR Nov 2015.
- Rolling out to ZID starting April 2015
- Rolling out to ZOB, ZBW, and ZDC in Fall 2015.

National Training

National Training –

- Air Traffic Control – on line course complete and available; 90 minute overview

- Subject Matter Expert (SME) – TMC/STMC
- Course Validated with National Release in March 2015
- Seven (7) day classroom training at FAAAC.
    - 100 students targeted in FY15
    - 250 students each in FY16 and FY17
    - All TMC/STMC's to receive training.

http://we.tl/loFPpAT071 or
https://employees.faa.gov/tv/?mediaId=1037

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TBFM Work Package 3

Definition of Program

✓ Continuation of TBFM to meet shortfalls not included in WP2:

- Terminal Sequencing and Spacing (TSS)

  - 104128-24 – Time-Based Metering in the Terminal Environment

  - NAC Tier 1a priority

  - RTCA Task Force Recommendation

- Integrated Departure/Arrival Capability (IDAC)

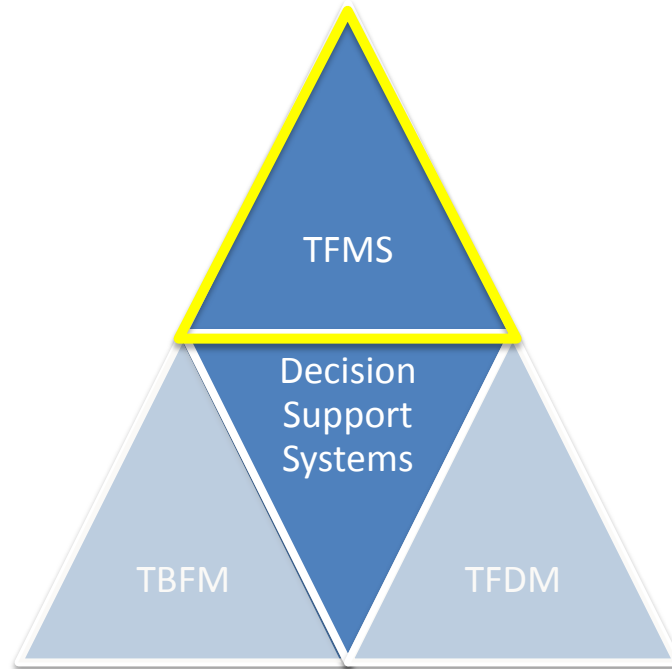 - 104117-11 – Integrated Departure/Arrival Capability

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Enhancement Details

- Terminal Sequencing and Spacing (TSS) - Extend the metering capability into the terminal area by providing tools to terminal ATC and TMU for time-based merging, sequencing and spacing.

  - 5 airports (IAH, LAX, PHX, ATL, SEA)

  - Enables better runway delivery/ accuracy/ consistency necessary for Performance Based Navigation (PBN) and end-to end metering.

  - Enables Flight Interval Management (FIM).

- Integrated Departure/Arrival Capability (IDAC)- Expand the deployment of the Integrated Departure Arrival Capability (IDAC), begun under TBFM WP2

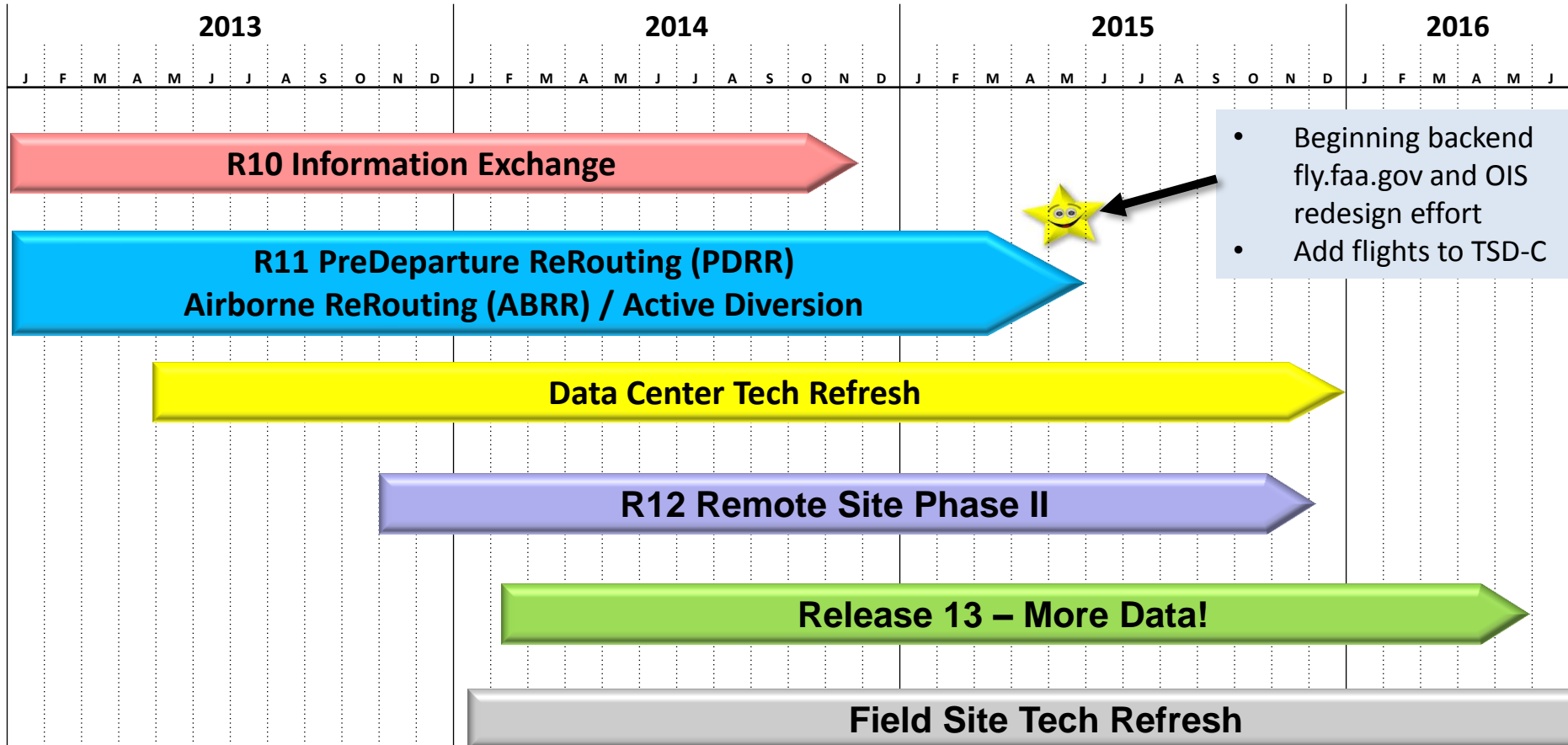 - Additional 5 ARTCCs (ZAB, ZJX, ZME, ZOA, ZTL) and associated towers.

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Time Based Flow Management (TBFM)

Traffic Flow Management System (TFMS)

TFMS Release Summary

	2013	2014	2015	2016

R10 Information Exchange

R11 PreDeparture ReRouting (PDRR)
Airborne ReRouting (ABRR) / Active Diversion

Data Center Tech Refresh

R12 Remote Site Phase II

Release 13 – More Data!

Field Site Tech Refresh

- Beginning backend fly.faa.gov and OIS redesign effort
- Add flights to TSD-C

TFM Data (Nov 2014) – New Data via SWIM

- Flow Constrained Area (FCA) / Flow Evaluation Area (FEA)
- Ground Delay Program (GDP) / Unified Delay Program (UDP)
- Airspace Flow Program (AFP)
- Collaborative Trajectory Options Program (CTOP)
- ATCSCC Advisories
- Ground Stop (GS)
- Reroutes
- Airport runway configuration and rates
- Airport deicing
- Restrictions
- Route Availability Planning Tool (RAPT) time-line data
- TFMS no longer RVR provider (now on SWIM)

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Retirement of Legacy Feeds

- Current legacy feeds to be retired (Nov 2015) (Initial notice of retirement sent January 2014)

- What will be decommissioned:
  – ASDI - Aircraft Situation Display to Industry
  – TFMDI - TFM Data to Industry
  – TFMDG - TFM Data to Government
  – FTM_Connect (Research)
  – TFMS RVR feed

- Additional TFMData changes:
  – Data not delayed
  – Security audits not required
  – Policy being developed for International data

Release 11 - Route Amendment

Reroutes can be done via Automation (TFMS to ERAM)

- Can be done Pre-Departure (PDRR)

    ✓ Accepted and automatically applied

- Can be done Airborne (ABRR)

    ✓ Sent to controller for implementation

- When: Working with ERAM on turn on date

Demo in Break Out Session Tomorrow

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Introduces the concept of >Protected Segments<

A Protected Segment is the portion of the route that a controller is expected to leave the aircraft on

>SYR J29 PXV J131 LIT<
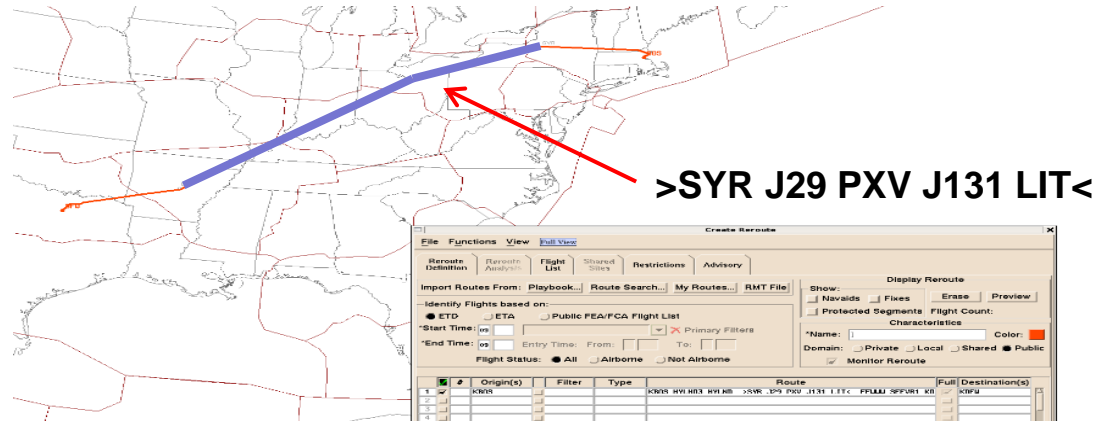
- Protected Segments are enclosed in Chevrons   **>…<**
- Protected Segments are depicted in Blue
- Reroute Monitor only checks the Protected Segment for conformance
- Protected Segments will "inhibit automatic route adaptation" by ERAM

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Diverted Flight List

- Stand alone application on TFMS workstation
- Displays flights that divert destination
- Displays summary counts
- Deployed at ATCSCC
- National deployment with R11

Demo in Break Out Session Tomorrow

TFMS Release 12 - November 2015

- **Implement new reporting tool**

  ❖ Provides users ability create, tailor/filter, save and export

  ❖ Changes available to CDM Community via TSD thin-client in Release 13

- **FSM and NTML to SGD thin client (FAA Only)**

  ❖ Small Facilities will now have access to full set of TFMS tools

TFMData Enhancements Release 13 – Spring 2016

- Terminal Flight Data Manager (TFDM) Interface
  - Ingest initial surface data elements for early implementation via SWIM
  - Improve TFMS departure modeling
  - Distribute new messages via TFMData
- Remaining ADL fields added
- International Data Provider (IDP) interface
  - Replace current legacy interfaces using SWIM/NEMS message exchange
- Replace legacy email / advisory delivery
  - Provide advisory and general message data from various TFMS apps in fully formed XML

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Data Exchange

FAA committed to adopt International Data Exchange standards:

– **Aeronautical Information Exchange Model (AIXM)**
  - Covers, airports, routes, TMIs, NAVAIDs, airspace sectors
  - http://www.AIXM.aero

– **Flight Information Exchange Model (FIXM)**
  - Evolving data format for flight specific life-cycle info
  - http://www.FIXM.aero

Data Mediation

- TFMS R10's TFMData Service created in native TFMS XML format

- TFMS R13's new TFMData Service Enhancements **(for TFDM and IDP)** to be AIXM and FIXM compliant

- How do I keep up with evolving standards

Mediation Service

- Initial mediator translates from R10 to AIXM/FIXM format

- When will it be available?

    - September 2015

- SWIM requesting testers (Jim Robb's email)

TFMData: How Do I Get Connected? Step 1

- Register for an account on the NAS Service Registry Repository (NSRR)
  - access detailed information on the TFMData service, such as the Web Service Description Document (WSDD).

- http://www.faa.gov/nextgen/programs/swim/nsrr_form

TFMData: How Do I Get Connected? Step 2

Register for an account on the Access Agreement Portal and request access to the TFMData service.

https://data.faa.gov

(May need to use Chrome)

- **Data will not be delayed**
- **Audits will no longer be required**

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TFMData: How Do I Get Connected? Step 3

- Send an email with a request to be transitioned from ASDI to the new TFMData service.
  - You will be contacted by one of the FAA's External Consumer On-Ramping team members who will coordinate a kick-off meeting to discuss next steps.

Data-To-Industry@faa.gov

How Do I Get More Info?

- Monthly TFMS Tech Telcon
  - Second Thursday of every month
  - Agenda topics accepted in advance
  - Next TELCON April 9th, 2015 1:00 PM
    - Register ahead of time to receive the bridge number and passcode.

    https://www4.gotomeeting.com/register/803358471
    - Send questions or advance TELCON topics to

    Chris.Burdick@faa.gov and/or Thomas.CTR.Paccione@faa.gov

Traffic Flow Management System (TFMS)

CDM
Collaborative
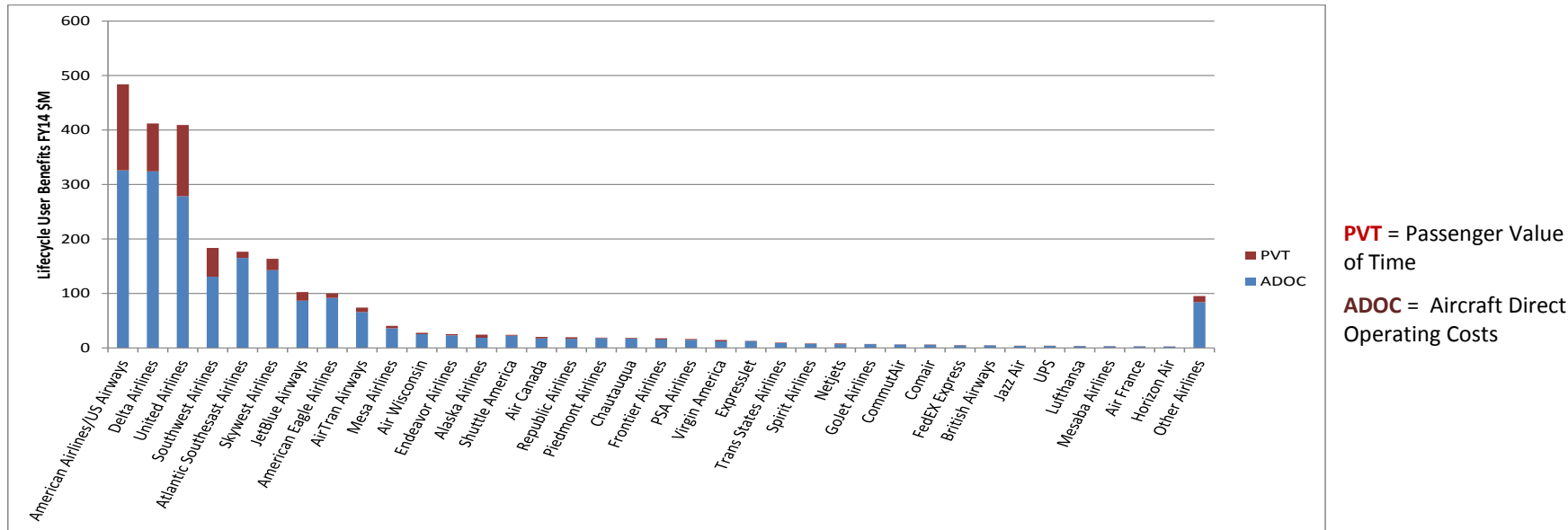Decision Making

TFDM Monetized Benefits Identified at IID

Flight Operators

Estimated Lifecycle user benefits by Top 40 Airlines at Configuration A Airports (Risk-Adjusted FY14 $M):

PVT = Passenger Value of Time

ADOC = Aircraft Direct Operating Costs

Please note TFDM information in this briefing may be subject to change until the FAA's Final Investment Decision is complete.

SWIM On-Ramping Process

1 Processing of required paperwork and formulize requirements

2 Development and testing of Consumer interface in the R&D Domain

3 Interoperability testing in the FTI National Test Bed (FNTB)

4 Cutover of Consumer interface to Production NEMS

5 Start consuming NAS data

1
- Complete the R&D Domain Connectivity Form
- Get access to the NSRR / Identify data products
- Develop on-ramping form
- Complete the FAA NAS Data Release Process

2
- Establish connectivity to the R&D Domain
- Develop Consumer interface
- Test with the Enterprise Messaging Service (EMS)

3
- Establish connectivity to the FNTB domain
- Develop and execute test plan

4
- Establish connectivity to the NESG
- Establish connectivity with the NEMS
- Meet NAS Data Release Board (NDRB) requirements

Note: Existing NEMS users may skip to the FNTB stage.

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Advanced Transformation and Mediation Services High Level Architecture
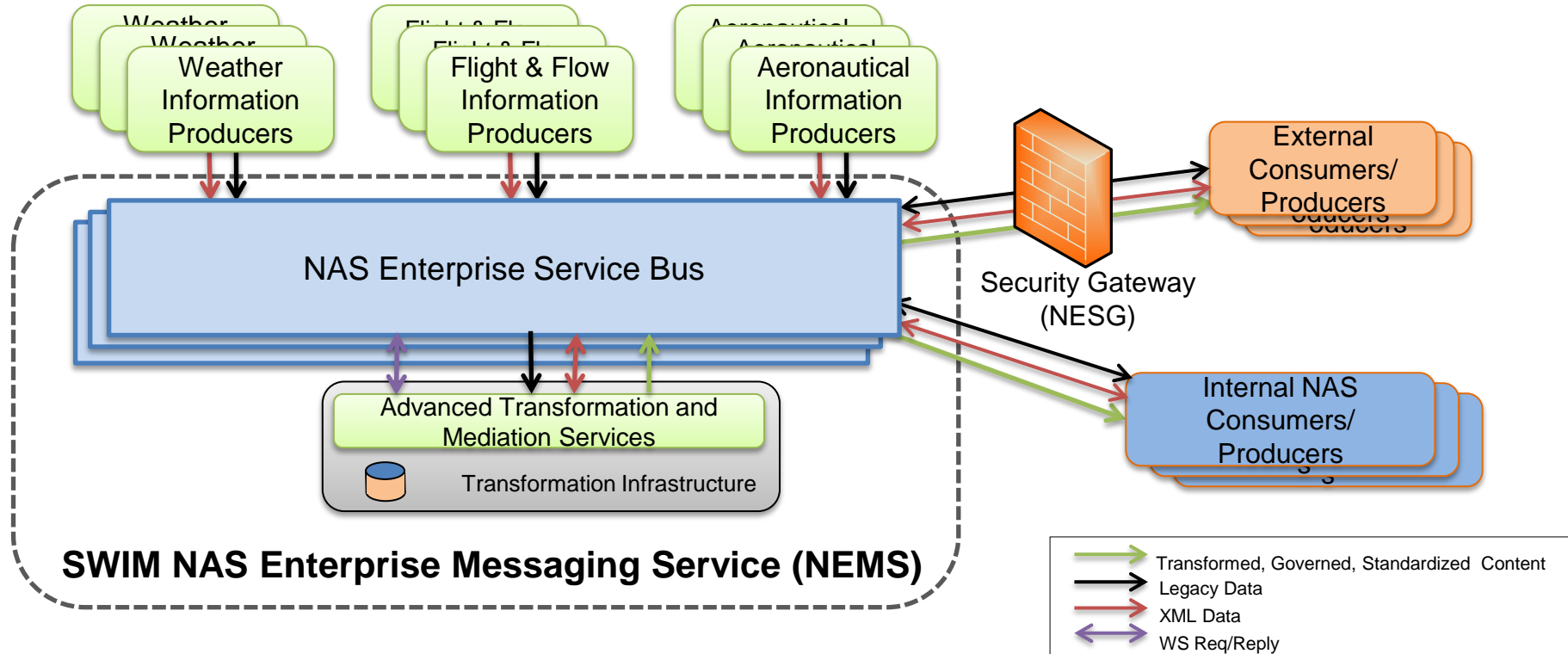
Basic Surface Data Elements in TFMS Release 13

Flight Data Provided by Flight Operators

Data Element	Description
Actual Off-Block Time (AOBT)	The actual time at which a flight has sent a 'block out' message from the gate or parking location. This information will be used to help determine the accuracy of flight operators' Earliest Off Block Time (EOBT).
Actual Takeoff Time (ATOT)	The time at which a flight lifts off from the runway as reported by the CDM Participant via a CDM message. If the CDM participant sends more than one value, the most recently submitted time is contained in this field. Otherwise, the value is null. This time stops the DOT3 time for departing flights
Actual Landing Time (ALDT)	The Actual time the flight has landed on the runway. Sharing arrival information provides essential information to facilitate gate conflict and demand/capacity imbalance predictions. This element is the DOT3 arriving aircraft time trigger.
Actual In-Block Time (AIBT)	The Actual time the flight has blocked in at the gate. Sharing arrival information provides essential information to facilitate gate conflict and demand/capacity imbalance predictions for both gate and departure predictions on availability.
Aircraft Tail/Registration #	A unique, alphanumeric string that identifies a civil aircraft and consists of the Aircraft Nationality or Common Mark and an additional alphanumeric string assigned by the state of registry or common mark registering authority. "Aircraft Registration Mark" in FIXM Core.
Earliest Off-Block Time (EOBT)	Time when the flight operator plans for an aircraft to push back from its assigned gate. The system can forecast surface demand vs. capacity based on flight operator's best estimation of push back time. The fidelity of EOBT is required for proper surface predictions and process.
Flight Cancellation	Message that indicates a flight has been cancelled. Identifies a cancelled flight to ensure that resources are not engaged and/or fully utilized.
Flight Intent	The Flight Intent would be limited to Flight Operator plan to push back early during a DMP and hold in the AMA.
Gate Assignment	Airport Gate that is assigned to a flight. Gate information will lead to more accurate ramp transit time (RTT) calculations and therefore more accurate ETD.
Initial Off-Block Time (IOBT)	The initial off-block that a flight provided. Used to save the original Off-Block time of the flight. Useful for flight data matching.
Earliest Runway Time of Departure (ERTD)	The flight operator estimate of runway departure time not including any traffic management initiatives.

Surface Data Exchange Evolution

Initial FOC Data Elements

- Actual Off-Block Time (AOBT)
- Actual Takeoff Time (ATOT)
- Actual Landing Time (ALDT)
- Actual In-Block Time (AIBT)
- Aircraft Tail/Registration #
- Earliest Off-Block Time (EOBT)
- Flight Cancellation
- Flight Intent
- Gate Assignment
- Initial Off-Block Time (IOBT)
- Earliest Runway Time of Departure (ERTD)

+

Additional Flight Intent Data

- Gate Return Intent
- Intended Departure Spot
- Intended Arrival Spot
- Intent to Hold in the Airport Movement Area During Arrival
- Intent to Hold in the Airport Movement Area During Departure
- Intent to Hold in the Airport non-Movement Area During Arrival
- Intent to Hold in the Airport non-Movement Area during Departure
- Intended Deicing Location
- Intent for a Flight to be Deiced

Additional Gate Data

- Arrival Stand Assignment
- Arrival Stand Availability
- Departure Stand Assignment

Other Additional Data

- Departure Readiness Status
- List of Acceptable Departure Runways
- List of Unacceptable Departure Runways
- TMAT Marked For Substitution Indication
- TMAT Relinquish Indication

FAA Provided Data

- Placeholder 1, Target Movement Area Entry Time [TMAT] in TFDM ConOps
- Placeholder 2, Target Off-Block Time [TOBT] in TFDM ConOps
- Placeholder 3, Target Take-Off Time [TTOT] in TFDM ConOps
- Placeholder 4, Projected Wheels Up Time [PWUT]

TFMS Data Placeholders to Enable Future TFDM

TFDM FID MAR 2016

TFMS R13 May 2016

TFDM IOC FY 2019

TFMS and TFDM Program Timeline

Acronyms

Acronym	Definition	Acronym	Definition	Acronym	Definition	Acronym	Definition
AAR	Airport Arrival Rate	DST	Decision Support Tools	IDRP	Integrated Departure Route Planning	SCT	Surface CDM System Sub-Team
AARDS	AAR Decision Support	EA	Enterprise Architecture	IDRP	Integrated Departure Route Planning	Seg.	Segment
ABRR	Airborne Rerouting	eCVRS	Electronic Computerized Voice Reservation System	IID	Initial Investment Decision	SIR	Screening Information Request
ADOC	Aircraft Direct Operating Costs	EDC	En Route Departure Capability	Info.	Information	SLE	Second Level Engineering
AFP	Airspace Flow Program	EDCT	Expect Departure Clearance Time	Infrast.	Infrastructure	SMA	Surface Movement Advisor
AIM	Aeronautical Information Manual	EFD	Electronic Flight Data	IOC	Initial Operating Capability	SOO	Surface Operations Office
AJE	En Route and Oceanic Services	EFS	Electronic Flight Strips	IP&A	Investment Planning & Analysis	SRM	Safety Risk Management
AJM	Program Management Office	EFSTS	Electronic Flight Strip Transfer System	IPRD	Initial Program Requirements Document	SSA	Surface Situational Awareness
AJV	Mission Support Services	EIS	Enterprise Infrastructures Services	ISD	In-Service Decision	SSD	Surface Situational Display
AMS	Acquisition Management System	EOBT	Estimated Off Block Time	ISPD	Implementation Strategy Plan Document	STA	Scheduled Time of Arrival
ARMT	Airport Resource Management Tool	ERAM	En Route Automation Modernization	ITM	Integrated TMI Modeling	STARS	Standard Terminal Automation Replacement System
ARSI	Arrival Route Status and Impact	ETA	Estimated Time of Arrival	JPDO	Joint Planning and Development Office	STD	Scheduled Time of Departure
ARTCC	Air Route Traffic Control Center	ETD	Estimated Time of Departure	JRC	Joint Resources Council	STDDS	SWIM Terminal Data Distribution System
ASDE-X	Airport Surface Detection Equipment Model X	ETMS	Enhanced Traffic Management System	MTG	Meeting	SWIM	System Wide Information Management
ASDI	Aircraft Situation Display to Industry	Eval.	Evaluation	NAS	National Airspace System	TBFM	Time Based Flow Management
ASSC	Airport Surface Surveillance Capability	EVM	Earned Value Management	NEMS	NAS Enterprise Messaging Service	TCA	Tactical Consumer Advocate
ATC	Air Traffic Control	F&E	Facilities and Equipment	NTML	National Traffic Management Log	TDLS	Tower Data Link Services
ATCSCC	ATC System Command Center	FAA	Federal Aviation Administration	OIS	Operational Information System	Tech Ops	Technical Operations
ATCT	Air Traffic Control Tower	FADE	FAA Airline Data Exchange	OT&E	Operational Test & Evaluation	TFDM	Terminal Flight Data Manager
ATS	Air Traffic Systems	FCA	Flow Constraint Area	P1/2	Phase 1/2	TFM	Traffic Flow Management
CACR	Collaborative Airspace Constraint Resolution	FDIO	Flight Data Input / Output	PDC	Pre-Departure Clearance	TFM-M	Traffic Flow Management Modernization
CATM	Collaborative Air Traffic Management	FEA	Flow Evaluation Area	PDMP	Pre-Determined Meter Point	TFMS	Traffic Flow Management System
CATMT	CATM Technologies	FIAP	Final Investment Analysis Plan	PDR	Preliminary Design Review	TMA	Traffic Management Advisor
CCFP	Collaborative Convective Forecast Product	FID	Final Investment Decision	PDRC	Precision Departure Release Capability	TMI	Traffic Management Initiative
CDM	Collaborative Decision Making	FOC	Flight Operations Center	PDRR	Pre-Departure Reroute	TMU	Traffic Management Unit
CDR	Critical Design Review	FSM	Flight Schedule Monitor	PLA	Project Level Agreement	TPC	TFMS Production Center
CFR	Call for Release	FXA	FCA & FEA	PMO	Program Management Office	TRACON	Terminal Radar Approach Control
CIP	Capital Investment Plan	FY	Fiscal Year	PO	Program Office	TRS-R	TFM Remote Site Re-engineering (Field site software)
CIT	Capital Investment Team	GDPE	Ground Delay Program Enhancements	PV	Present Value	TSD	Traffic Situation Display
CIWS	Corridor Integrated Weather Systems	GIM-S	Ground Based Interval Management for Spacing	PVT	Passenger Value of Time	UDP	Unified Delay Program
CSG	CDM Stakeholder Group	GUI	Graphical User Interface	RAPT	Route Availability Planning Tool	VP	Vice President
CTOP	Collaborative Trajectory Options Program	HITL	Human-in-the-loop	RFI	Request for Information	WP	Work Package
DCC	ATCSCC	IAD	Washington Dulles	RIO	Risks, Issues, and Opportunities	XFS	Execution of Flow Strategies
DEN	Denver International Airport	IARD	Investment Analysis Readiness Decision	RMLS	Remote Monitoring and Logging System	ZHU	Houston Air Route Traffic Control Center
DFW	Dallas Fort Worth International Airport	ICR	Integrated Collaborative Routing	RNAV	Area Navigation	ZLA	Los Angeles Air Route Traffic Control Center
DLC	Departure Clearance Request	IDAC	Integrated Departure Arrival Capability	RNP	Required Navigation Performance	ZMA	Miami Air Route Traffic Control Center
DSP	Departure Spacing Program	IDP	Improved Demand Prediction	RRIA	Reroute Impact Assessment	ZNY	New York Air Route Traffic Control Center
DSS	Decision Support Systems			S-CDM	Surface CDM	ZOB	Cleveland Air Route Traffic Control Center